

REMARKS

The present response is to the Office Action mailed in the above-referenced case on January 15, 2003. Claims 1-32 are pending for examination. The Examiner has rejected claims 15 and 30 due to informalities, and has rejected claims 1-9 under 35 U.S.C. 112, second paragraph, as being indefinite. Claims 10, 12-14, 21, 23-24 and 26 are rejected under 35 U.S.C. 102(b) as being anticipated by Harriman (U.S. 5,898,687), hereinafter Harriman. Claims 15-20 are rejected under 35 U.S.C. 102(e) as being anticipated by Takahashi (6,240,075), hereinafter Takahashi. Claim 11 is rejected under 35 U.S.C. 103(a) as being in patentable over Harriman over Chao (5,724,351), hereinafter Chao. Claims 27-31, 23, and 25 are rejected under 35 U.S.C. 103(a) as being unpatentable over Harriman in view of Takahashi. Claim 32 is rejected under 35 U.S.C. 103(a) as being unpatentable over Harriman, over Takahashi, and further in view of Teraslinna (4,991,171), hereinafter Teraslinna. Claims 1-8 are further rejected under 35 U.S.C. 103(a) as being unpatentable over Holden over Takahashi. Claim 9 is further rejected under 35 U.S.C. 103(a) as being unpatentable over Holden over Takahashi and further in view of Harriman.

Regarding the Examiner's objection to claims 15 and 30, and rejection of claims 1-9 as being indefinite, applicant herein amends claims 15 and 30 to correct the objectionable language, and herein amends claim 1 to further clarify the limitations.

Applicant has carefully studied the prior art presented by the Examiner and the Examiner's rejections and statements in the instant Office Action. In response to the Examiner's merit rejections of applicant's claims, applicant herein amends the claims to more particularly point out and distinctly claim the subject matter of applicant's invention regarded as patentable. Applicant further provides argument that the claims as amended clearly and unarguably

distinguish over the prior art, either singly or combined. Applicant points out and argues the key limitations of applicant's claims, which the Examiner appears to have misunderstood in the rejections and statements of the instant Office Action.

Regarding applicant's independent claims 10, 21 and 24, the Examiner stated that Harriman discloses all of the limitations of applicant's claims. In response applicant herein amends the language of claims 10 and 21 to recite a multicast engine coupled to at least one of the ports of the fabric card, the ports having at least one ingress path for receiving data packets, and at least one egress path for outputting data packets, characterized in that the data packets assigned for multicasting are replicated and/or modified and output to the ingress path into the port, and further characterized in that the multicast engine is integrated as a part of the port of the fabric card in the router to. Applicant reproduces claim 10 as amended below.

Applicant's claim 10 as amended now recites:

10. (Currently Amended) A multicast-capable fabric card within a data router comprising:

*at least two ports coupled to each other by data paths; and
at least one multicast engine coupled to at least one of the ports;
at least one ingress path into each port for receiving data packets;
at least one egress path out of each port for outputting data packets;
characterized in that data packets assigned for multicasting arrive at
the multicast-capable fabric card and are delivered to the multicast engine
wherein they are replicated and/or modified as needed for multicast and
forwarded-output to the ingress path into the port, and further characterized
in that the multicast engine is integrated as a part of the port of the fabric
card in the router.*

Applicant's claim 24 recites a multicast-capable data router for practicing the claimed invention in accordance with claims 10 and 21. Applicant herein accordingly amends the language of claim 24 to further characterize in that the circuitry of the multicast engine is integrated into the circuitry of one of the ports of the fabric card.

Applicant directs the Examiner's attention to applicant's Fig. 5 illustrating various components and connectivity of the multicast-capable port 325 of applicant's Fig. 4 in an embodiment of the present invention. Port 325 is illustrated with both an egress path and an ingress path comprising the basic routing paths of port 325 for normal (non-multicast traffic). A multicast engine 339 is provided as the replicating component of port 325, and in a preferred embodiment as illustrated in Fig. 5, is implemented with basic logic circuitry as an integrated part of the ASIC enabling port 325.

The reference of Harriman clearly does not teach a fabric card having at least one multicast-capable port wherein the circuitry for multicasting is integrated as part of the circuitry of the port of the fabric card, as is now specifically recited in applicant's claims 10, 21 and 24 as amended. Harriman specifically teaches in column 4, lines 35-64 that, upon receiving the cell at the switching fabric 110 from the source port 102, and determining that the cell requires multicast, it is forwarded to a separate multicast engine circuit 200, which is clearly illustrated in Fig. 1 of Harriman. Harriman, therefore, now clearly fails as a primary reference for anticipating all of the limitations of applicant's claims 10, 21 and 24 as amended.

The Examiner has rejected applicant's claims 15-20 as being anticipated by Takahashi. The Examiner stated that, regarding claim 15, Takahashi discloses applicant's multicast engine, one or more first ports (109) for communicating with one or more second ports (121) of one or more switch elements, and circuitry for modifying or replicating packets, characterized in that the packets are replicated and/or modified and then forwarded via one or more first ports to one or more of the second ports.

Applicant respectfully disagrees and points out to the Examiner that Takahashi clearly does not teach replicating and/or modifying packets and then forwarding the packets via port 109 to port 121, because port 109 is clearly taught to be the input port of replication processor 112 (multicast engine). The data packets arriving at port 109 have not yet been replicated or otherwise modified by the multicast engine, so replicated and/or modified packets cannot possibly be forwarded to one or more of the second ports (121) via one or more of the first ports (109), as stated by the Examiner. The replication unit 112 of Takahashi replicates the packets received via input port 109, and the replicated packets are then transmitted out of replication module 110 via output port 121. After replication and/or modification, the packets clearly are not forwarded to anywhere via the one or more first ports (109), as stated by the Examiner.

Regarding applicant's independent claim 16, the Examiner stated that Takahashi discloses applicant's multicast-capable data router having a multicast-capable port (110) for replicating multicast data packets. Applicant argues, however, that element 110 of Fig. 1 of Takahashi is clearly not a port at all; rather, element 110 is a separate replication module component coupled to other modular components of the arbitration module illustrated. Applicant's invention specifically teaches and claims a multicast-capable port (325) in a fabric card, not a separate module as in Takahashi, and it is within the port that replication and/or modification of data packets takes place, via multicast circuitry integrated into, and as part of the circuitry of the port. Applicant argues that this is a key and important distinction of applicant's invention over the prior art, and Takahashi clearly fails to explicitly teach all of applicant's limitations of claim 16.

The Examiner has rejected claim 11 as being unpatentable over Harriman over Chao, stating that Harriman does not explicitly disclose that the multicast-capable fabric card coupled by port paths to other cards within the same router, relying on Chao for this teaching. Applicant's claim 11 is

dependent from claim 10, which, in view of applicant's above amendments and arguments on behalf of claim 10, is now clearly patentable over Harriman. Claim 11 is therefore patentable on its own merits, or at least as depending from a patentable claim.

The Examiner has rejected claims 27-31, 22 and 25 as being unpatentable over Harriman in view of Takahashi. Regarding claims 27 and 31, the Examiner stated that Harriman discloses substantially applicant's method steps, with the exception that Harriman does not explicitly teach providing a plurality of multicast engines within a router. The Examiner relies on Takahashi to make up for this deficiency. In response, applicant herein amends independent claim 27 to specifically recite a method for multicasting data packets wherein the multicast engine is integrated as a part of a port of a line card in the router. As argued above on behalf of claim 16, a combination of Harriman and Takahashi still fails to teach the key limitation of claim 27 as amended, because Takahashi teaches multicasting circuitry integrated with the circuitry of a replication module (110), which teaches away from integrating the multicast circuitry into the circuitry of the port itself, as taught and claimed in applicant's invention.

Applicant's claim 31 depends from method claim 27, which, as amended and argued above, overcomes the prior art combination of Harriman and Takahashi. Claim 31 is, therefore, patentable on its own merits, or at least as dependent from a patentable claim.

Regarding claims 28-29, 22 and 25, the Examiner admits that Harriman does not disclose the claimed features, stating further back Takahashi, however, in the same field of endeavor, discloses that the multicast engine 112 is integrated as a part of a port (110) of a line/fabric card. Claims 22, 25 and 28 have been herein canceled above by applicant in accordance with the amendments to the parent claims herein made by applicant. Claim 29 depends from applicant's independent method claim 27, which, as amended and argued above by applicant, is now clearly and unarguably patentable over

the combined references, therefore, claim 29 is now patentable on its own merits or at least as dependent from a patentable claim.

Regarding claim 30, the Examiner admits that Harriman does not disclose the claimed features, and that Takahashi, in the same field of endeavor, makes up for the deficiencies of Harriman. Claim 30 depends from applicant's independent method claim 27, which, as amended and argued above by applicant, is now clearly and unarguably patentable over the combined references, therefore, claim 30 is now patentable on its own merits or at least as dependent from a patentable claim.

The Examiner has rejected claim 32 as unpatentable over Harriman/Takahashi as applied to claim 27 above, and further in view of Teraslinna. Claim 32 depends from claim 31, which depends from applicant's independent method claim 27, which, as amended and argued above by applicant, is now clearly and unarguably patentable over the combined references of Harriman/Takahashi. Therefore, claim 32 is now patentable on its own merits or at least as dependent from a patentable claim.

Claims 1-8 are rejected as being unpatentable over Holden over Takahashi. The Examiner stated that, regarding claim 1, Holden does not explicitly disclose the claimed features of applicant's claim, stating further that Takahashi, in the same field of endeavor, discloses that the multicast-capable component (112) of Takahashi outputs the replicated or re-addressed packets to the ingress path (column 4, lines 3-6), and it therefore would have been obvious to apply Takahashi's teaching into Holden's system, the motivation being simultaneous multicast processing as required by customer.

In response applicant points out the key limitation of applicant's claim 1, specifically reciting that the replicated and/or re-addressed packets are output to the ingress path. In order to further clarify the limitation, applicant herein slightly amends the language to specifically recite that the packets are output to the ingress path into the port.

Applicant now wishes to direct the Examiner's attention to applicant's specification beginning on page 17, line 16, with reference to applicant's Fig. 5. It is clearly described that applicant's multicast engine completes the data packet replication and address assignment, the replicated data packets are transmitted to the ingress path of port 325 as incoming data packets. The replicated/modified data packets are then queued in appropriate sections of a virtual output queue (not shown) associated with port 325. The packets then ultimately enter Crossbar Switching Facility 327 (Fig. 4) for distribution over various paths according to the assigned addresses for the replicated data packets.

In order to maintain appropriate management of data flow through multicast port 325, a Back-Pressure (BP) module 351 is provided within port 325, and adapted to prevent input of new data into port 325 during replicating (multicasting) activity of the engine. BP module 351 interfaces with M-Cast engine 339 within port 325 via a control line 345 to monitor the ongoing activity of the multicast engine.

Now referring to the teaching of Takahashi, specifically Fig. 1, applicant argues that the replicated or re-addressed packets are, in fact, not output to the ingress path into the port at all. Takahashi specifically teaches that the data packets are replicated or otherwise modified in the replication processor 112, and then transmitted out of replication processor 112 via output 121. This is an output port, not an input port. Takahashi teaches that the packets are ultimately transmitted to the ingress path of the crossbar facility 80, but applicant argues that crossbar facility 80 is a separate module having separate ingress/egress paths, and therefore, Takahashi clearly does not teach or suggest outputting replicated/modified packets to the ingress path of the multicast-capable port wherein the replication/modification takes place.

The Examiner has rejected claim 9 as being unpatentable over Holden over Takahashi, and further in view of Harriman. Claim 9 is ultimately dependent from applicant's independent claim 1, which, as amended and

argued above, is clearly patentable over the combined prior art, because neither reference teaches, suggests or has motivation for outputting replicated/modified data packets to the ingress path of the port. Claim 9, therefore, is patentable on its own merits, or at least as dependent from a patentable claim.

Applicant believes in the claims 1, 10, 15, 16, 21, 24 and 27 as amended and argued above by applicant are now clearly and unarguably patentable over the prior art presented by the Examiner. Claims 22, 25 and 28 are herein canceled. Depending claims 1-9, 11-14, 17-20, 23, 26 and 29-32 are then patentable on their own merits, or at least as dependent from a patentable claim.

As all of the claims have been clearly shown as amended and argued above to be patentable over the prior art presented, applicant respectfully requests that applicant's above claims be reconsidered, the rejections are withdrawn and that the case be passed quickly to issue. If any fees are due beyond fees paid with this amendment, authorization is made to deduct those fees from deposit account 50-0534. If any time extension is needed beyond any extension requested with this amendment, such extension is hereby requested.

Respectfully Submitted,

Russ Tuck et al.

by



Donald R. Boys

Reg. No. 35,074

Donald R. Boys
Central Coast Patent Agency
P.O. Box 187
Aromas, CA 95004
(831) 726-1457